

PATENT SPECIFICATION

DRAWINGS ATTACHED

840,029



Date of Application and filing Complete Specification
December 5, 1958.

No. 39293/58.

Application made in Italy on October 4, 1958.

Complete Specification Published July 6, 1960.

Index at Acceptance:—Classes 17 (2), B1 (A4 : B4A : C5); and 87 (2), A1R (22A : 22X : 27).

International Classification:—A43d, B29d, h.

COMPLETE SPECIFICATION

Process and apparatus for manufacturing rubber-soled shoes and the like

CORRECTION OF CLERICAL ERROR

SPECIFICATION NO. 840,029

The following correction is in accordance with the Decision of the Superintending Examiner, acting for the Comptroller-General, dated the thirtieth day of May, 1961.

Page 1, lines 1-3, *after* "We," *delete* "OFFICINE MECCANICHE ANTONIO NOVA, a body corporate organised under the laws of Italy" and *insert*:-

"Antonio Nova, Renzo Nova and Oscar Nova, all Italian citizens, trading as the firm NOVA ANTONIO".

THE PATENT OFFICE,
29th August, 1961.

DS 95574/1(2)/R.153 200 8/61 PL

last on which the shoe upper is placed.

20 Moulds are known each comprising two complementary members that are joined together approximately in the longitudinal middle plane of the sole to be moulded thereby to close the mould during the moulding operation, said members being drawn apart 25 laterally of the said plane on completion of moulding in order to open the mould and enable removal of the shoe with its moulded on sole, the position then occupied by said mould members being one in which their 30 portions that form the side walls of the mould cavity are situated approximately horizontally and face upwardly. Each mould member is usually formed with a projecting lip which during moulding closes the 35 clearance between said side walls of the mould cavity and the lower portion of the shoe upper placed on the co-acting last.

When shoes manufactured by the above described process are to be provided with 40 welts fitted to the upper face of the sole edges and projecting outwardly from the lower margin of the shoe upper, either of the following procedures (a), (b) may be adopted:—

(Price 3s. 6d.)

or the upper not only entails a loss of time and increase of cost, but is a highly critical operation, serious difficulties being met in maintaining the welt properly in position 65 within the mould.

Adhesive bonding of the welt to the sole edge of a finished shoe requires considerable skill from the worker, is not always successful and in any case increases the manufacturing cost. 70

The present invention avoids these drawbacks and enables rubber-soled shoes having separately attached welts to be manufactured throughout successfully at low cost. 75

To this end and according to the invention the portion of each of the mould members forming the side walls of the mould cavity is formed directly beneath the 80 afore-said lip with a groove; the edge of a strip adapted to form one half of the welt to be fitted to the shoe is inserted into the groove in each mould member in the open mould position, the strip being of such width that 85 its other edge contacts in the closed mould position the lower portion of the side wall of the upper; the sole is moulded in a known manner by filling the mould cavity with a

Price 25p

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COMPLETE SPECIFICATION

Process and apparatus for manufacturing rubber-soled shoes and the like

We, OFFICINE MECCANICHE ANTONIO NOVA, a body corporate organised under the laws of Italy, of 11 via Brescia, Legnano (Milan), Italy, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention concerns a process and apparatus for manufacturing rubber-soled shoes and the like (hereinafter simply termed shoes) of the kind provided with separately attached welts.

According to a known process the shoe sole is moulded under the section of pressure and heat in the cavity of a mould which, during the moulding step, is closed by a last on which the shoe upper is placed.

Moulds are known each comprising two complementary members that are joined together approximately in the longitudinal middle plane of the sole to be moulded thereby to close the mould during the moulding operation, said members being drawn apart laterally of the said plane on completion of moulding in order to open the mould and enable removal of the shoe with its moulded on sole, the position then occupied by said mould members being one in which their portions that form the side walls of the mould cavity are situated approximately horizontally and face upwardly. Each mould member is usually formed with a projecting lip which during moulding closes the clearance between said side walls of the mould cavity and the lower portion of the shoe upper placed on the co-acting last.

When shoes manufactured by the above described process are to be provided with welts fitted to the upper face of the sole edges and projecting outwardly from the lower margin of the shoe upper, either of the following procedures (a), (b) may be adopted:—

(Price 3s. 6d.)

(a) The welt is stitched to the lower upper margin and placed when the last with the shoe upper thereon is brought into juxtaposition with the mould, beneath the aforesaid lip, whereby the welt is sealed to the sole together with the upper during the sole moulding process;

(b) The separately manufactured welt is adhesively bonded to the upper face of the sole edge and is trimmed if necessary.

Either of the above described procedures yields rubber-soled shoes that are similar in appearance to leather shoes. However, both procedures entail serious drawbacks which do not recommend their adoption and general use.

Stitching of the welt to the lower margin of the upper not only entails a loss of time and increase of cost, but is a highly critical operation, serious difficulties being met in maintaining the welt properly in position within the mould.

Adhesive bonding of the welt to the sole edge of a finished shoe requires considerable skill from the worker, is not always successful and in any case increases the manufacturing cost.

The present invention avoids these drawbacks and enables rubber-soled shoes having separately attached welts to be manufactured throughout successfully at low cost.

To this end and according to the invention the portion of each of the mould members forming the side walls of the mould cavity is formed directly beneath the aforesaid lip with a groove; the edge of a strip adapted to form one half of the welt to be fitted to the shoe is inserted into the groove in each mould member in the open mould position, the strip being of such width that its other edge contacts in the closed mould position the lower portion of the side wall of the upper; the sole is moulded in a known manner by filling the mould cavity with a

Price 25p

suitable material and subjecting it to the action of pressure and heat, whereby the welt strips are bonded to the upper face of the sole edges and securely held in position with respect to the upper during moulding, and the sole is stripped from the mould, whereupon the welt portion extending beyond the lateral wall of the sole is trimmed.

The foregoing and other features of the invention will be better understood from the following more detailed description aided by the accompanying drawings which show by way of non-limiting example one form of apparatus suitable for carrying out the process.

Fig. 1 is a diagrammatic part-sectional elevation of a vulcanizing press apparatus for shoes, the complementary mould members being in their open position;

Fig. 2 is a cross-sectional view on a larger scale of a constructional detail of the apparatus shown in Fig. 1;

Fig. 3 is a diagrammatic cross-sectional view on a larger scale of certain components of the apparatus shown in Fig. 1 in a position in which the complementary mould members are approaching closure, components of the shoe being also in position;

Fig. 4 is a similar sectional view to Fig. 3 but wherein the complementary mould members are in their closed position;

Fig. 5 is a similar view to Figs. 3 and 4, the members of the apparatus being in their position at the end of a moulding operation;

Fig. 6 is a cross-sectional view of the stripped shoe carried by the last; and

Fig. 7 is a view similar to Fig. 6, the shoe welt being shown in its trimmed condition.

The illustrated vulcanizing press apparatus for shoes comprises the following as its main components: a last 1 carried by a supporting plate 2 displaceable in a vertical plane on the frame (not shown) of the apparatus and arranged to carry the portion of the shoe designed to receive the sole facing upwardly; mould members 3, 4 that form the side walls of the mould cavity in which the sole to be fitted to the shoe carried by the last 1 is formed; and a piston 5 adapted to enter the cavity and exert therein the required moulding pressure, said piston 5 being supported by a hydraulic motor diagrammatically represented by 6, the hydraulic motor being carried by the aforesaid frame.

The mould members 3, 4 are supported by arms 7, 8 respectively, adjustable in length and mounted for oscillation about pivots 9, 10 carried by the plate 2, said pivots being symmetrically arranged with respect to the vertical middle plane X—X of the apparatus as shown.

The inner walls 11, 11 of the mould members 3, 4 are formed at the ends facing the

arms 7, 8 with stepped recesses 12, 12 closed partially by plates 13, 14 secured to the mould members by means of screws 15 (Fig. 2). The plates are formed with tapered ends 13a, 14a respectively, extending beyond the level of the walls 11, 11 and adapted to be pressed against the margin of the shoe upper placed on the last 1 in order to safely seal the mould on the last side, after the mould members 3, 4 are angularly brought together to the moulding position.

The movement of the mould members 3, 4 from their position shown in Fig. 1 to the closed mould position in the direction of the arrows F is facilitated by the provision of handles 16, 17. Means (not shown) are provided for retaining the mould members 3, 4 in the closed mould position. Such means operate during moulding of the sole and prevent drawing apart of the mould members 3, 4 and escape of any material from the inside of the mould along the vertical joining planes between the mould members 3, 4 at the toe and heel portion of the shoe being made.

In order to manufacture a moulded sole shoe and fit the welt to the top face of the sole edge during moulding of the sole while avoiding the necessity of attaching the welt to the lower margin of the upper by stitching the following procedure is adopted:—

Upon assembling a shoe upper 20, provided with an insole if desired, on the last 1 a strip 18 made of the same material as the upper (such as leather) is inserted into each of the recesses 12, 12 which take the form of grooves through the provision of the plates 13, 14 secured to the mould members 3, 4 respectively. Each strip length equals half the overall length of the welt to be fitted to the shoe. The strip width equals the spacing of the bottom of the grooves 12, 12 from the tips of the plates 13, 14 but may be made wider (as shown at 19 in Fig. 2) without objection.

After inserting the strips 18 into the grooves 12, 12 the mould members 3, 4 are angularly moved in the directions of the arrows F to the fully closed mould position, when the walls 11, 11 are vertically arranged.

Next (Fig. 4) a suitable mix 21 adapted to form the sole is poured into the mould cavity which is laterally confined by the mould members 3, 4 and is closed at the bottom by the last 1 having the shoe upper thereon. As shown by Fig. 4 the plates 13, 14 bear against the lower margin of the upper as well as against the edges of the strips 18 inserted into the grooves 12, 12 thereby sealing the clearance between the walls 11, 11 of the mould members 3, 4 and the outer surface of the lower portion of the shoe upper. The insertion of the strips 18 into the grooves 12, 12 safely holds the strips in proper position during moulding.

Next (Fig. 5) the piston 5 is lowered (the piston surface may be suitably embossed for patterning as desired the tread surface of the sole) and the required pressure is exerted within the mould in order to form the sole, heat being supplied at the same time by any suitable means. On completion of the moulding the piston 5 is raised, and the mould members 3, 4 are returned to their initial position shown in Fig. 1.

The resulting shoe has the appearance shown in section in Fig. 6. The welt is securely bonded to the top face of the sole edge and contacts the lower marginal surface of the upper. However, the opposite welt edge extends beyond the lateral wall 22 of the sole, trimming being necessary in order to impart to the shoe its ultimate appearance shown in Fig. 7.

Although a vulcanizing press apparatus has been described wherein the required sole moulding pressure is effected by compressing a mix such as a rubber mix within the mould by means of a hydraulically operated piston, the upper being placed on a last with the portion of the upper to be bonded when the position of the upper carrying last is inverted, as well as when the sole forming cavity is closed by components integral with the mould members 3, 4 and pressure is created by gases set up from a mix adapted to form spongy rubber under the section of heat, or when synthetic resins are employed instead of rubber for forming the sole and are injected under pressure into the mould cavity.

Preferably the welt strips are each of a length exceeding half the overall welt length, their ends being bevelled whereby the junctures of each strip with the other at the toe and heel portions of the finished shoe are inclined to the longitudinal middle plane of the shoe.

WHAT WE CLAIM IS:—

1. Process for manufacturing rubber-soled shoes or the like provided with separately attached welts, of the kind in which the sole is formed by the action of pressure and heat in the cavity of a mould closed during moulding by a last having a shoe upper placed thereon, said upper being simultaneously bonded to the sole, said mould comprising two complementary members joined together approximately along the longitudinal middle plane of the sole to be moulded so as to close the mould during moulding, said mould members being movable apart laterally of said plane on completion of moulding in order to open the mould and enable removal of the sole, and being alternately moved to a position in which their portions that form the lateral walls of the mould cavity are arranged substantially horizontally and face upwardly, each of said mould portions being formed with a project-

ing lip that during moulding seals the clearance between said lateral walls and the lower portion of the side walls of the shoe upper placed on the last, characterized in that the process comprises the steps of providing the portion of each of the mould members forming the mould side walls, directly beneath the aforesaid lip, with a groove; inserting the edge of a strip adapted to form half of the welt to be fitted to the shoe into the groove in each mould member in the open mould position, the welt strip width being such that the other strip edge engages during moulding the lower portion of the upper side wall; moulding in a manner known *per se* the shoe sole by introducing a suitable mix into the mould cavity and subjecting it to the action of pressure and heat whereby the welt strips are bonded to the top edge of the sole during moulding of the latter; stripping the shoe by opening the mould and thereupon trimming the welt portion extending beyond the lateral sole wall.

2. Process as claimed in claim 1, wherein the welt strips are each of a length exceeding half the overall welt length, their ends being bevelled whereby the junctures of each strip with the other at the toe and heel portions of the finished shoe are inclined to the longitudinal middle plane of the shoe.

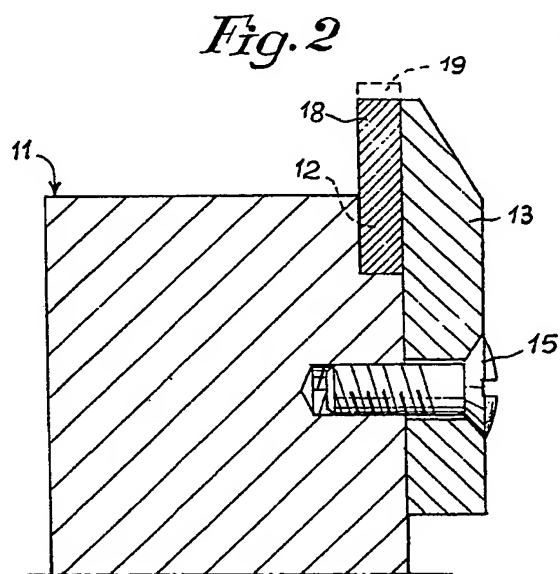
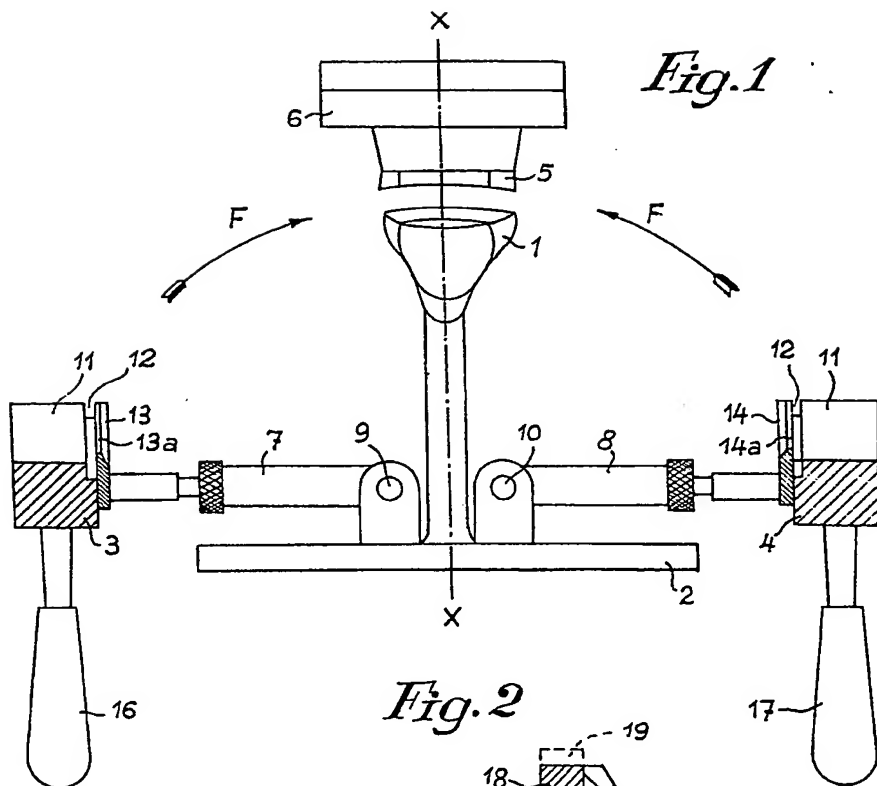
3. Apparatus for carrying out the process claimed in claim 1 or 2, comprising a mould the cavity of which is closed during moulding by a last having a shoe upper placed thereon, said mould including two complementary mould members closed together during moulding approximately along the longitudinal middle plane of the sole to be moulded and movable apart laterally of said plane on completion of moulding in order to open the mould and enable removal of the shoe, the mould members in the fully open position having their portions that form the side walls of the mould cavity arranged approximately horizontally facing upwardly, each of said portions being formed with a projecting lip for sealing during moulding the clearance between said mould side walls and the lower portions of the side walls of the upper on the last, characterized in that the portions of the mould members forming the mould side walls are each formed with a groove adapted to receive one edge of a strip arranged to form one half of the shoe welt.

4. Apparatus as claimed in claim 3, characterized in that the portions of the mould members forming the side wall of the mould cavity are each formed at the ends of the cavity closed by the upper on the last with a stepped recess, the corresponding faces of the mould members having secured thereto by means of screws plates extending

5 towards the middle of the mould cavity and forming together with the abovementioned recesses grooves receiving the strips each adapted to form one half of the welt to be fitted to the shoe.

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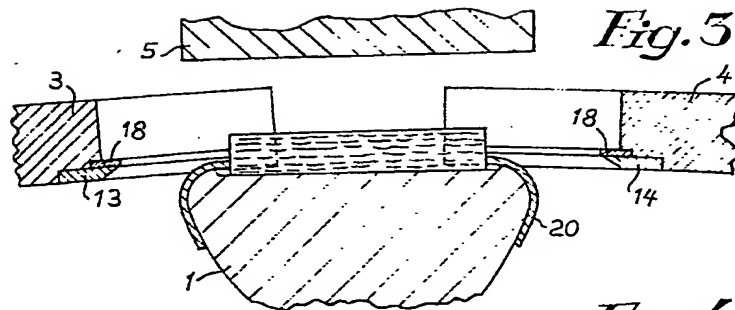


Fig. 3

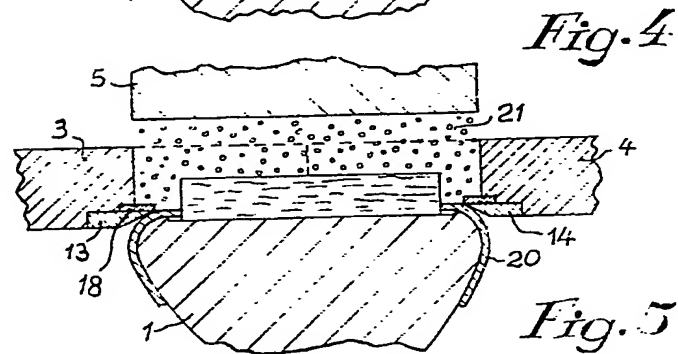


Fig. 4

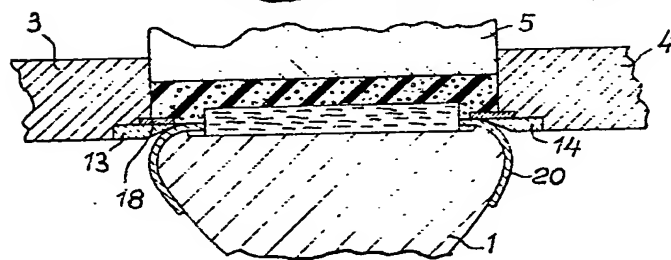
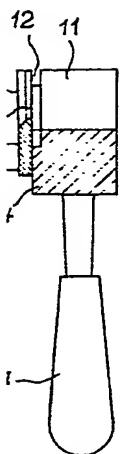
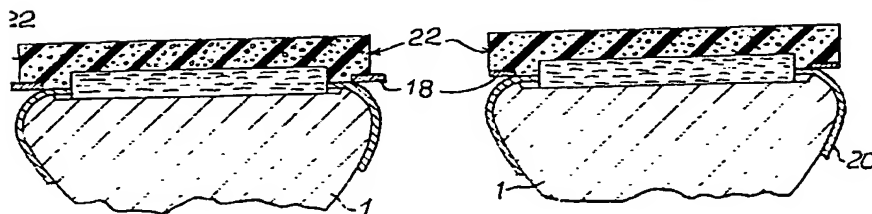


Fig. 5

Fig. 6

Fig. 7



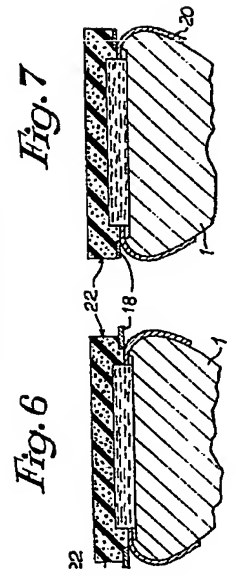
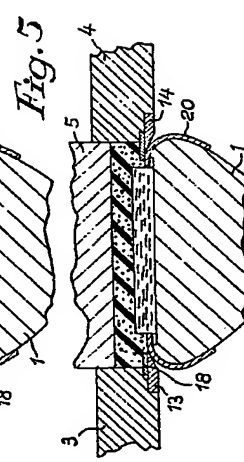
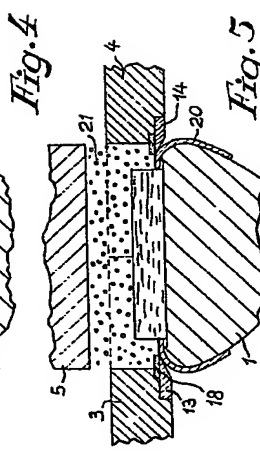
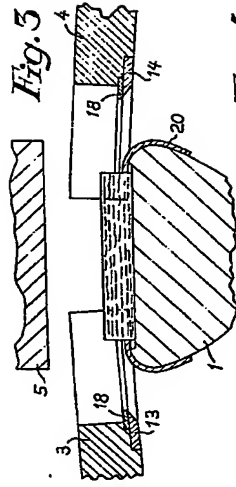
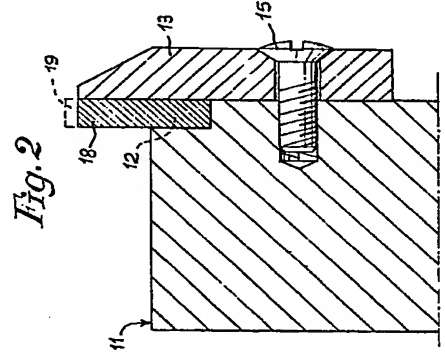
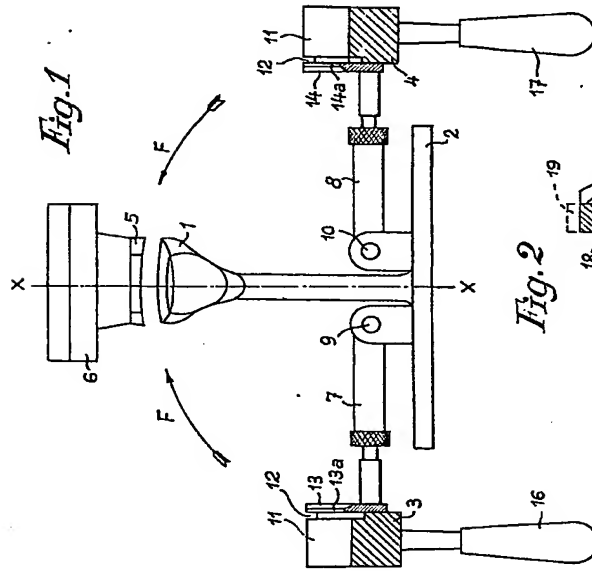


Fig. 7